



## 2021 Lecture Series

## A/Professor Elisa Hill-Yardin

School of Health and Biomedical Sciences, STEM College, RMIT University

will present a seminar entitled

## Interactions of the nervous system with bacteria: understanding gastrointestinal issues in autism

Friday 10 September 2021, 11am

Institute for Glycomics Zoom online – details by email



## Abstract

Our work in the Hill-Yardin Gut-brain Axis lab focuses on understanding the second brain in the gastrointestinal tract. Our research themes include i) identifying the cause of gut dysfunction in transgenic mouse models of neurological disease ii) determining how neurons communicate with the lymphoid system and inflammation and iii) understanding interactions between the nervous system and bacteria.

We've shown that gene mutations associated with autism alter the proportions of neuron populations in the mouse enteric nervous system as well as gut motility and permeability in mice. These nervous system changes also disrupt the microbiome, modify responses to inflammation and cause increased aggression and repetitive behaviours in mice.

We're expert in detecting changes in gut contraction patterns and gut permeability in rodents. Our video-imaging assays detect subtle changes in gut motility caused by impairments in the gut nervous system and we're enhancing this capability in collaboration with software engineers. We routinely assess for changes in neuron numbers and immune cells of the gut and brain using immunofluorescence in rodent models. We've recently built our capability to record neuron activity in gut tissue using whole cell patch clamp electrophysiological recording. This expertise is a powerful way to characterise neuron subtypes in gastrointestinal tissue - it combines neuronal function, gene expression and cell morphology data. In close collaboration with the Applied and Environmental Microbiology group led by Prof Ashley Franks at La Trobe University, we're also working to understand interactions between the nervous system and gut microbes.

This research is envisaged to clarify how gut disorders influence the brain and behaviour in animal models and identify new therapeutic targets to improve gut health.